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REPORT

TO THE MINISTRY OF TRANSPORT

UPON THE

ACCIDENTS

THAT OCCURRED

ON THE

RAILWAYS OF GREAT BRITAIN AND IRELAND

During the Year 1921.

Presented to Parliament by Command of His Majesty.

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REPORT.

SIR,

I have the honour to present a Report on the accidents that have occurred in the working of the railways of Great Britain and Ireland during the year 1921, founded on returns made by the Railway Companies under the Regulation of Railways Act, 1871 (Section 6), and on reports upon certain accidents made after inquiry by Officers of this Department.

The total route length of the railways open for traffic at the end of the year 1921 was 23,723 miles. The greater portion of this mileage consisted of two or more lines of rails. The total track mileage was 40,917 without sidings, and 56,164 with sidings.

The reduction (*vide* Table III), as compared with 1920, in the relative figures for passenger journeys and passenger and freight train mileage, *i.e.*, 22 and 13 per cent. respectively, shows the effect upon traffic conditions during the coal scarcity which prevailed in the months April to July, 1921. This reduction has to be borne in mind in dealing with the following statistics.

The accidents are, as usual, grouped under the three main heads of—

(1) Train accidents, (2) Accidents caused by the movement of trains and railway vehicles, exclusive of train accidents, and (3) Accidents on railway premises not due to train accidents or to the movement of trains and railway vehicles.

They are further subdivided in each of the three groups according as they relate to—

(A) Passengers, (B) Servants, and (C) Other Persons.

It should be noted that all accidents which occur in the working of railways or on railway premises to "Passengers" and "Other Persons" are required to be reported, however slight the injuries may be; but, as regards "Servants," only those accidents which cause the servant injured to be absent for at least one whole day from his ordinary work are required to be reported. Any person killed in an accident, or so severely injured as to die at any subsequent date after the accident, but prior to the date of this Report, is included in the Tables as "Killed."

The following Table shows the total number of Persons killed or injured by accidents in connection with the working of railways.

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TABLE I.

	Total for the Year 1921		*Total for the Year 1920*		Increase or Decrease		*Average for 1910–1919*	
	Killed	Injured	*Killed*	*Injured*	Killed	Injured	*Killed.*	*Injured*
A *Passengers* :								
1 From accidents to trains, rolling-stock, permanent-way, &c	18	589	*6*	*684*	+12	− 95	*39*	*632*
2 By other accidents in which the movement of trains or railway vehicles was concerned	71	1,506	*115*	*1,991*	−44	−485	*113*	*1,794*
3 By accidents in which the movement of trains, &c, was not concerned	4	569	*8*	*548*	− 4	+ 21	*7*	*679*†
B *Servants of Companies or Contractors* : *								
1 From accidents to trains, rolling-stock, permanent-way, &c	11	81	*5*	*177*	+ 6	−96	*7*	*141*
2 By other accidents in which the movement of trains, &c, was concerned	220	2,811	*371*	*4,237*	−151	−1426	*367*	*4,335*
3 By accidents in which the movement of trains, &c, was not concerned	31	13,284	*44*	*17,514*	−13	−4,230	*48*	*21,276*†
C *Other Persons* :								
1 From accidents to trains, &c	3	20	*3*	*42*	—	− 22	*2*	*10*
2 { Persons passing over railways at level crossings	30	8	*44*	*19*	−14	− 11	*61*	*31*
Trespassers (including suicides)	349	59	*324*	*91*	+25	− 32	*382*	*115*
Persons on business at stations, &c, and other persons not included above	24	81	*38*	*134*	−14	− 53	*50*	*149*
3 By accidents in which the movement of trains, &c, was not concerned	23	493	*33*	*496*	−10	− 3	*26*	*563*†
Total	784	19,501	*991*	*25,933*	−207	−6,432	*1,102*	*29,725*

---

* Of contractors' servants 6 were killed and 57 injured In 3 of the fatal and 46 of the non-fatal cases the movement of trains, &c, was not concerned

† Of accidents in which the movement of trains and railway vehicles were not concerned only the fatal cases were required to be reported in the years 1916, 1917, and 1918

I.—TRAIN ACCIDENTS.

The following Table gives the number of casualties in the various classes of train accidents.

TABLE II.

Class of Accident.	A. Passengers.		B. Servants.		C. Other Persons.		Total all Persons.	
	K.	I.	K.	I.	K.	I.	K.	I.
1. Collisions in which passenger trains were concerned ..	18	568	6	14	—	—	24	582
2. Other collisions	—	—	—	38	—	3	—	41
3. Derailments of passenger trains	—	9	—	1	—	—	—	10
4. Other derailments ..	—	1	1	7	—	1	1	9
5. Accidents due to failure of engines or rolling-stock ..	—	4	2	11	—	—	2	15
6. Fires in trains	—	—	1	1	—	3	1	4
7. Other accidents	—	7	1	9	3	13	4	29
Total	18	589	11	81	3	20	32	690

The following Table shows the average numbers of persons reported as killed or injured by train accidents for periods of ten years ending 1884, 1894, 1904, and 1914 respectively; with the figures for each year from 1915 to 1921 inclusive. The number of passenger journeys and the train mileage is also given.

TABLE III.

Year.	A. Passengers.		B. Servants.		C. Other Persons.*		Passenger Journeys (Millions).†	Passenger and Freight Train Mileage (Millions).
	K.	I.	K.	I.	K.	I.		
1875-1884 (Average). ..	28	915	19	154	—	—	598·4	238·2
1885-1894 " ..	21	600	8	101	—	—	798·6	304·9
1895-1904 " ..	12	581	11	139	2	7	1,100·7	382·8
1905-1914 " ..	21	554	9	142	1	8	1,263·5	421·8
1915	269‡	1,432‡	9	183	—	2	—§	—§
1916	3	350	12	182	1	17	—§	—§
1917	12	260	5	144	—	2	—§	—§
1918	8	463	5	146	6	25	—§	—§
1919	3	513	7	114	8	30	1,551·9	349·0
1920	6	684	5	177	3	42	1,604·5	378·2
1921	18	589	11	81	3	20	1,252·1	323·4

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* The "Other Persons" consist mainly of persons killed or injured through collisions of trains with road vehicles, or with gates at level crossings, or persons travelling on business in trains, such as Post Office Employees, as well as persons standing on platforms, who were injured in buffer-stop collisions, &c.

† Exclusive of journeys by season-ticket holders.

‡ 224 killed and 242 injured in double collision at Quintinshill, Caledonian Railway.

§ The figures for Passenger Journeys and Train Mileage were not obtained from the Railway Companies for the years 1915-18.

The following Table shows the numbers of engine-drivers, firemen, guards, &c., killed or injured by train accidents, while working trains, during the year 1921 :—

TABLE IV.

——	Number employed.	Killed.	Injured.
Engine-drivers	38,762	4	14
Firemen	37,014	2	19
Guards (Goods) and brakesmen ..	18,435	3	22
Guards (Passenger)	9,412	1	9
Other Grades	664,173	1	17
Total	767,796	11	81

INQUIRIES INTO TRAIN ACCIDENTS.

The following Table gives a comparative statement of the number of train accidents inquired into by the Inspecting Officers of Railways, classified under certain heads, for the past year and for each of the preceding ten years.

TABLE V.

Nature of Accident.	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921
1. Collisions in which passenger trains were concerned ..	16	12	21	12	15	7	4	5	23	20	14
2. Other collisions	4	4	4	3	—	2	1	5	5	2	—
3. Derailments of passenger trains ..	3	7	4	3	5	3	1	2	2	1	3
4. Other derailmts.	—	—	1	—	—	—	—	—	—	—	—
5. Accidents due to failure or defective condition of engines or rolling stock ..	—	1	—	—	—	—	—	—	—	—	1
6. Fires in trains ..	—	—	—	—	—	—	—	—	—	2	—
7. Other accidents	—	—	—	1	—	—	—	—	—	—	—
Total ..	23	24	30	19	20	12	6	12	30	25	18

1. Five of the 18 cases of train accident which were inquired into by the Inspecting Officers of Railways were attended with loss of life, as follows :—

	Passengers.		Servants.		Other Persons.	
	Killed.	Injured.	Killed.	Injured.	Killed.	Injured.
Collision near Abermule, Cambrian Railway	14	33	3	3	—	—
Collision at Wapping, E. London Ry.	—	14	2	2	—	—
Explosion of engine-boiler at Buxton, L. & N. W. Ry... ..	—	—	2	1	—	—
Collision at New Street, Birmingham, L. & N. W. Ry...	3	24	—	—	—	—
Collision at Coatdyke, N. British Ry.	1	20	—	—	—	—

In the remaining 13 cases a total of 285 passengers and 7 servants were injured or suffered ill-effects.

2. The 14 collisions (*vide* Table V) may be subdivided as follows :—

Between two passenger trains	5
" passenger and freight trains or vehicles	8
" passenger trains and light engines ..	1
	—14

Of these the most prominent was the Abermule case—a head-on collision between two passenger trains on a single line. Laxity in supervision, irregularity in the working and custody of single line tokens and instruments, combined with failure of enginemen to examine the token, led to this disaster. Happily, accidents of this type upon single lines are of great rarity upon British railways, but the case affords an object lesson to all railwaymen of the necessity for discipline, and exact obedience to the regulations in connection with single line working.

Of the 3 cases of derailment, one was due to defective maintenance of permanent way, one to ineffective spring hanger fittings, and the third to irregular operation of power-worked facing points by a signal linesman.

The remaining case was that of a locomotive boiler explosion, fortunately a rare type of accident, which was attributed to inexact valve fitting, and insufficient precaution in methods of testing steam gauges against the safety valves.

3. The 18 cases inquired into may in respect of primary cause be generally allocated as follows :—

(*a*) Failure or insufficiency of equipment	3
(*b*) Failure of enginemen to obey or observe danger signals	5
(*c*) Failure of enginemen to give effect to regulations	1
(*d*) Failure of signalmen to observe and give effect to regulations	3
(*e*) Failure of employees, other than enginemen and signalmen, to give effect to regulations ..	3
(*f*) Faulty methods of signalling and of yard working	2
(*g*) Irregularities in single line working (Abermule)	1

4. Available methods of prevention. The cases under (*a*) are sufficiently dealt with in paragraph 2.

In 3 out of the 6 cases due to failure of enginemen, automatic train control would have been the most certain preventive. Greater caution on the part of enginemen is indicated as necessary in the remainder of the cases, one of which, however, would have been prevented by disallowing an undesirable method of warning acceptance.

Track circuit or its equivalent would have prevented 2 of the 3 cases due to failure of signalmen.

One of the instances included under (*e*) indicates the necessity for the use of a continuous brake with goods trains, whilst the 2 remaining cases point to the necessity for obedience to regulations.

The case of Abermule illustrates the desirability for locating single line instruments in the signal-box, or, where this is not possible, of the provision of electrical interlocking between the single line tokens and the starting or advance starting signal giving access to the single line section.

5. General lessons to be learnt from the year's experience include :—

(*i*) Necessity for supervision of all details of single line working, especially with the view to preventing the unauthorised assumption of duties by unqualified men.

(*ii*) Exact and standardized methods of manufacture of important locomotive fittings, *e.g.*, safety valves, and more efficient supervision of enginemen's reports upon engines.

(*iii*) Desirability of adopting working arrangements which will not necessitate the use of the warning acceptance.

(*iv*) Failure of detonators to convey intended warning to locomotive men.

6. The reports upon these cases of accident included recommendations in 15 instances. These recommendations have been wholly or partially complied with in 12 cases; one recommendation with regard to traffic-working was not accepted, and in 2 cases they are under reconsideration.

II.—ACCIDENTS CAUSED BY THE MOVEMENT OF TRAINS AND RAILWAY VEHICLES EXCLUSIVE OF TRAIN ACCIDENTS.

Of the 694 persons killed and 4,465 injured under this heading, 71 of the killed and 1,506 of the injured were passengers, 217 of the killed and 2,800 of the injured were employees of the Railway Companies, 3 of the killed and 11 of the injured were servants of contractors employed on the railways, and 403 of the killed and 148 of the injured were neither passengers nor servants of the Companies or contractors.

Twenty-one passengers were killed and 718 injured by falling between trains and platforms or on to platforms, ballast, &c., when attempting to enter or alight from trains; 10 were killed and 4 injured by falling off platforms and being struck or run over by trains, 4 were killed and 5 injured when crossing lines at stations, 22 were killed and 37 injured by falling out of carriages during the running of trains, and 14 were killed and 742 injured from other causes.

Fifty-three servants of the Companies and of contractors were killed and 1,462 injured by accidents occurring during shunting operations, of whom 3 were killed and 367 injured while coupling or uncoupling vehicles; while, apart from shunting operations, 6 were killed and 128 injured by falling off or when getting off or on trains, engines, vans, &c., in motion, 5 were killed and 40 injured by coming in contact with overbridges or erections at the sides of the lines, 1 was killed and 485 injured while attending to the machinery, &c., of engines in motion, 41 were killed and 61 injured while working on the permanent way, sidings, &c., 82 were killed and 163 injured while walking or standing on the line on duty or when proceeding to or from work, and 32 were killed and 472 injured from other causes.

Thirty persons were killed and 8 injured while passing over railways at level crossings, 181 were killed and 41 injured while trespassing on the lines, 168 committed suicide and 18 were injured while attempting suicide, and 24 were killed and 81 injured while on business at stations and sidings or in other circumstances.

The following Table shows the average numbers of persons killed or injured by accidents in connection with the movement of trains and railway vehicles (excluding train accidents) for four periods of ten years ending 1884, 1894, 1904, and 1914 respectively; with the figures for the years 1915 to 1921 inclusive. The numbers of passenger journeys and of servants employed are also given.

TABLE VI.

Year.	A. Passengers.		B.* Servants of Railway Companies.		C. Other Persons.†		Passenger Journeys.‡	Servants Employed.
	K.	I.	K.	I.	K.	I.	Millions.	
1875-1884 (Avrge).	105	703	560	2,267	459	283	598·4	291,143
1885-1894 ,,	97	771	440	2,448	446	233	798·6	367,146
1895-1904 ,,	116	1,501	457	3,822	522	306	1,100·7	530,692
1905-1914 ,,	101	2,140	379	4,856	559	308	1,263·5	613,987
1915	162	2,355	398	4,937	521	334	—§	643,135¶
1916	147	1,195	396	3,503	427	326	—§	643,135¶
1917	110	850	326	2,679	368	263	—§	643,135¶
1918	120	755	287	2,551	367	225	—§	643,135¶
1919	83	1,835	316	3,834	426	217	1,551·9	643,135¶
1920	115	1,991	367	4,230	406	244	1,604·5	767,796††
1921	71	1,506	217	2,800	403	148	1,252·1	767,796††

* Of contractors' servants 3 were killed and 11 injured in 1921.

† The "Other Persons" include persons using level crossings, trespassers, persons on business at stations or sidings, &c.

‡ Exclusive of journeys by season ticket holders.

§ The figures for passenger journeys were not obtained from the Railway Companies in the years 1915-18.

¶ Number employed in 1913.

†† Number employed on 19th March, 1921.

The fatalities and cases of injury to servants in this class of accidents have been classified in respect of primary cause, as shown in the following Table :—

TABLE VII.

Cause	Movement Cases.			
	Fatal.	Percentage.	Non-fatal.	Percentage.
1. Misadventure or accidental ..	43	19·82	1,913	68·32
2. Want of caution or misconduct on the part of the injured person ..	150	69·13	618	22·07
3. Want of caution or breach of rules, &c., on the part of servants other than the persons injured	14	6·45	158	5·64
4. Defective systems of working, dangerous places, dangerous conditions of work, or want of rules or systems of working	6	2·76	33	1·18
5. Defective apparatus, appliances, &c., or want of sufficient appliances, safeguards, &c.	3	1·38	77	2·75
6. Neglect or non-observance of Rules under the Railway Employment (Prevention of Accidents) Act, 1900	1	·46	1	·04
Total	217	100·00	2,800	100·00

A classification of the accidents which occurred in connection with the coupling and uncoupling of vehicles in 1921, with the corresponding figures for 1920, is given in the following Table :—

TABLE VIII.

	1921.				1920.			
Coupling or uncoupling with pole	Killed	2	Injured	194	Killed	4	Injured	280
Coupling or uncoupling without pole ..	,,	—	,,	24	,,	5	,,	41
Coupling or uncoupling screw-coupled vehicles	,,	1	,,	145	,,	6	,,	216
Adjusting the automatic couplings	,,	—	,,	3	,,	—	,,	3
Other coupling accidents	,,	—	,,	1	,,	—	,,	3
Total ..	Killed	3	Injured	367	Killed	15	Injured	543

Of the persons killed and injured while passing over level crossings, 11 were killed and 3 injured at public road crossings, 7 were killed and 3 injured at occupation crossings, and 12 were killed and 2 injured at footpath crossings.

INQUIRIES.

During the year 1921, 426 inquiries were held by the Assistant Inspecting Officer, and Sub-Inspecting Officers of Railways, into accidents, other than train accidents, that involved fatal or other injuries to 444 persons, nearly all of whom were servants of the Railway Companies, the remainder being principally contractors' servants and persons at work or transacting business on the Companies' premises. Of this number 366 inquiries related to accidents to 377 servants of Railway Companies due to the movement of vehicles. In 164 cases recommendations were made to the Railway Companies; and in 116 cases the recommendations were adopted, in 40 cases they were not adopted, and in 8 cases they are still under consideration.

The following Table shows the causes to which the accidents that occurred to servants of the Railway Companies were attributed, distinguishing the cases into which Inquiries were held.

TABLE IX.

——	Inquired into.	Not Inquired into.	Total.	Percentage.
1. Misadventure or accidental ..	68	1,888	1,956	64·833
2. Want of caution or misconduct on the part of the injured person ..	206	562	768	25·456
3. Want of caution or breach of rules, &c., on the part of servants other than the persons injured	59	113	172	5·701
4. Defective systems of working, dangerous places, dangerous conditions of work, or want of rules or systems of working	26	13	39	1·293
5. Defective apparatus, appliances, &c., or want of sufficient appliances, safeguards, &c.	17	63	80	2·651
6. Neglect or non-observance of Rules under the Railway Employment (Prevention of Accidents) Act, 1900	1	1	2	·066
Total accidents to servants of Railway Companies	377	2,640	3,017	100·000

It is difficult to assign more than 121, or 4·01 per cent., of the accidents to preventable causes. Of these:—

9 were attributable to the want of brake levers on both sides of wagons.
13 to defective capstans.
13 to defective wagon brakes.
12 to an insufficiency of clearance between vehicles and structures.
21 to dangerous systems of working on the permanent way, in tow-roping, shunting, &c.
22 to defective engine equipment.
1 to an insufficiency of lighting.
10 to ground obstructions at stations and sidings.
2 to defective turn-tables.
8 to defective vans and wagons.
7 to failures of coupling poles, brake sticks and similar equipment.
3 to miscellaneous causes.

Recommendations have been made, and the necessary action has, where reasonably practicable, been taken under all these heads with good effect.

A substantial reduction of accidents to railway servants under all headings is noticeable during the year, particularly in connection with the coupling and uncoupling of vehicles (Table VIII). More care and a greater regard to regulations is undoubtedly the cause, and it is to be hoped that the improvement will continue. Generally, it will be seen that the great bulk (64·8 per cent.) of the total accidents are due to misadventure or accidental causes. Want of caution, however, still accounts for a considerable number (31·1 per cent.). Improvement in this respect can only be obtained by educating the men in personal carefulness. This is being done in many instances by means of Safety propaganda, and the general education of the staff by this means is highly desirable.

III.—ACCIDENTS ON RAILWAY PREMISES NOT CONNECTED WITH THE MOVEMENT OF RAILWAY VEHICLES.

The following information is given as regards the cases shown in Table I. These accidents, for the most part, are not attributable to railway working, and should not properly be classed as Railway Accidents.

A. Passengers.

By falling on steps or from platforms, &c., in station limits 4 were killed and 273 injured, and from other causes 296 were injured.

B. Servants of Companies or Contractors.

Of the total of 13,315 non-movement accidents, 12,617, or nearly 95 per cent., may be described as industrial accidents of a more or less non-preventable character; 400, or 3 per cent., were due to want of personal care; 101, or ·76 per cent., arose through negligence on the part of other persons; and 197, or 1·48 per cent., have been attributed to defective apparatus or want of sufficient appliances, safeguards, &c.

These non-movement accidents include 2 killed and 4,022 injured while engaged in handling goods; 1 killed and 1,920 injured when attending to engines at rest; 19 killed and 2,638 injured by falls on railway premises; 5 killed and 2,817 injured in the course of ordinary duties upon permanent way, and 4 killed and 1,887 injured from other causes.

C. OTHER PERSONS.

Twenty-three persons other than passengers or servants were killed and 493 injured on railway premises, 9 of whom were killed, and 367 injured while on business at stations or sidings. Of the fatal cases, 3 were due to the falling of goods, &c., from vehicles, 6 to persons falling off walls, bridges, &c., 3 to persons falling from stationary vehicles, 3 to persons being caught between or run over by road vehicles, 2 to persons falling on steps or stairs, and 6 to other causes

I have, &c.,

J W. PRINGLE, *Colonel,*
Chief Inspecting Officer of Railways.

15th September, 1922.

THE SECRETARY,
MINISTRY OF TRANSPORT.